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Expert discussion

Caring for and keeping the elderly in their homes

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ABSTRACT

Population aging is a global issue. The problem is especially critical in societies, such as China and India, where there has been both rapid aging of the population and a tradition that children are the primary caregivers for their elderly parents who are no longer independent. This article discusses a variety of options for various types of professional and non-professional caregivers and services for the elderly in their homes used in the U.S. and how technology has been used to support this heterogeneous model of caregiving. Efforts have been made to coordinate among caregivers and outside services and track changes in health conditions effectively over time through the greater use of technology. These ideas offer a possible path for other societies, such as China and India, facing growing health needs and limited resources to care for the elderly.

1. Introduction

Population aging is a global issue. One concern is a shortage of hospital beds,[1] making it necessary to provide more complex care to the elderly with chronic or comorbid health conditions while they are living at home. At the same time, an aging population also reduces the availability of family caregivers. The problem is especially critical in societies, such as China and India, where there has been both rapid aging of the population and a tradition that children are the primary caregivers for their elderly parents who are no longer independent. Based on the world population prospects conducted by the Department of Economic and Social Affairs Population Division of the United Nations,[2] China's population has been aging rapidly. There are now 123 million people (9 percent of the population) considered to be old (defined as age 65 and older), and China is expected to become the world's most aged society by 2030. By 2050, China's older population will likely reach 330 million (23.9%), nearly a quarter of its total population. This rapid increase by percentage may have resulted from a combination of China's "one-child" policy and an increase in life expectancy, which will most likely continue to improve. India's old population (defined as age 60 and older) has been increasing dramatically. The number is projected to climb from 96 million (8 percent of the population) in 2010 to 323 million (19 percent) in 2050, a number greater than the total U.S. population in 2012. This profound shift in the share of older Indians has become a large concern in terms of caring them in their homes.

In the U.S., efforts have been made to involve a greater use of technology that may enhance home caregiving. This article will discuss how the old are cared for at home in the U.S., focusing on who is providing care services for the elderly in their homes and how technology supports caregiving in homes.

2. Background

In the United States, 13.1% of population in 2010 were considered old, and the proportion is projected to increase to 21.4% by 2050, which is a significantly faster rate than the populations of many European, East Asian and Latin American countries. The leading chronic conditions among people at ages 65 and older are as follows: hypertension (51.2%), high cholesterol (44.0), heart disease (22.3%), mental illness (21.3%), diabetes (18.8%), arthritis (17.4%), cancer (15.2%), back problems (14.5%), and COPD (14.0%).[3] Sixty-three percent of those age 65 and older have two or more chronic conditions—multiple chronic conditions.[4] Costs for repeated hospitalizations account for approximately 20% of the annual healthcare budget; however, studies have found that 16% of hospital readmissions were avoidable.[5,6] In addition, it has been estimated that more than 99% of the elderly over the age of 65 have expressed a desire to stay at home as long as possible.[7] How to care

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for these elderly effectively and keep them at home as they desire has been very critical in preventing repeated hospital admissions that result in escalating healthcare costs.

3. Who are providing care services for the elderly in their homes?

When the chronic conditions of the elderly are such that they cannot adequately care for themselves, caregivers are enlisted to support them in their homes. These caregivers can be categorized as non-professional and professional caregivers. Each type of caregiver provides care services differently, but they share the common goal of helping elderly individuals remain healthy while living in their own homes and communities.

3.1. Non-professional caregivers

Non-professional caregivers include unpaid family caregivers and paid informal caregivers. The unpaid family caregivers might include a family member such as a spouse, son or daughter, and/or friends. Paid informal caregivers are typically home care aides, either managed by the family or a commercial or government agency in the community.

3.2. Families

In the United States, 43.5 million adult family caregivers care for someone 50+ years of age, and 14.9 million care for someone who has Alzheimer's disease or other dementia.[8] Parent care is the primary caregiving situation for mid-life caregivers, with 70% of the caregivers between the ages of 50 and 64.[9] Survey research has found that 72% of unpaid caregivers cared for a parent, step-parent, mother-in-law, or father-in-law, and 67% of caregivers provided for someone age 75 or older.[10] Similar research has also indicated that unpaid caregivers are predominately female, with some college education, work full or part-time, and report struggling to balance the care (on average 20 h per week) with their own family responsibilities.[11] A family caregiver may receive Paid Family Leave insurance benefits for up to six weeks in a 12-month period if she or he is insured and unemployed due to time taken off from work to care for an ill family member. Family caregivers routinely assist the frail elderly with activities of daily living (ADLs), including bathing/showering, dressing, feeding, toileting, personal hygiene and grooming, transfers and mobility within the home. Caregivers also assist with many instrumental activities of daily living (IADLs), including grocery shopping, housekeeping, preparing meals, managing finances, administering and supervising medications, transportation, and arranging and/or supervising paid services. Family caregivers also monitor the health conditions of the elderly, and when they deem necessary, seek professional assistance or take their loved one to a hospital for more complex care.

3.3. Home care aides

In the U.S., home care aides held approximately 2.1 million jobs in 2012. According to the U.S. Bureau of Labor Statistics, about half of them were working in a patient's home.[12,13] The total number of such aides is projected to grow to over 3 million by 2022.[14] Over 56.5% of them are aged 35 years and over.[15] Unlike the family and friend caregivers, home care aides typically do not attend a traditional four-year college or university; many earn only a certificate of completion in a short-term home healthcare training program. A typical training involves classroom instruction and professional hands-on training including some hours with patients. The duration of such training is 3–4 weeks. Despite limited education and lack of formal healthcare training, home health aides are in high demand with exponential growth expected, in part because of Medicare's push for more home and community-based services in lieu of more expensive nursing home care.[16] Despite high demand and projected growth, however, home care aides receive low wages, averaging roughly $10.00 per hour, somewhat less than the average wage of a cashier in the U.S. ($11.22), according to the most recent U.S. Census Bureau's Current Population Survey. In 2015, wages for home aides should rise as they will be covered by U.S. federal minimum wage laws and overtime protections, rights denied to them for years.[17] Supervised by a registered nurse or other medical or social services professional, home care aides monitor the basic health conditions of the elderly and do wound care and bandaging, in addition to ADL and IADL assistance.

Common for both groups of caregivers (professional and non-professional) are a lack of formal healthcare training and the prevalence of stress, although the degree and nature of their challenges may differ. Family caregivers often cite higher levels of perceived stress, social isolation, difficulty finding time to care for oneself, and lack of work-life balance, resulting in a negative impact to their emotional well-being.[18,19] In addition, many caregivers of the elderly are themselves growing older. Data show that of those caring for someone aged 65+, the average age is 63 years with one third of these caregivers in favor of poor health.[20] Without proper support and strategies to manage chronic stress, these unpaid informal caregivers may compromise their own health and reduce their lifespan by as much as 10 years.[18] Although the overwhelming majority of family caregivers provide appropriate care and a supportive environment for their older relatives, caregiving creates stresses that affect both caregivers and care recipients, and these stresses may trigger potentially harmful caregiver behaviors that place dependent elders at risk for abuse.[21]

Compared to family caregivers, home care aides tend to be younger, but their educational levels are lower, and many suffer from poverty and job dissatisfaction.[15] Generally, home health aides do not have specialized training. Some may have on-the-job training, while others may have certification from the National Association for Home Care and Hospice, or a local hospital, community college or healthcare agency. A 2007 study of home health aides conducted by the Center for Disease Control,[15] the most extensive to date, characterized the economic plight of home care aides as a "financially vulnerable workforce, with low family income, a large percentage that currently or previously received public benefits" (p. 8). While home care aides see their work as meaningful, they report low levels of satisfaction with benefits and compensation; stress and on-the-job injuries are often cited as reasons for job dissatisfaction. Consequently, a high turnover rate has become a significant concern. Even if adequate numbers of certified home care aides are trained, a labor shortage remains because of the high turnover rate.[22]

3.4. Professional caregivers

Professional caregivers include home health visiting nurses, rehabilitation therapists and healthcare social workers. The therapies comprise physical therapy, speech-language pathology and occupational therapy services. Professional caregivers deliver services at the elder patient's home to help them develop independence with daily activities in a convenient and comfortable setting, allowing families to be closely involved in the recovering/rehabilitation process.

3.5. Home health visiting nurses

Currently in the US, professional home healthcare is provided to patients mainly by home health visiting nurses (VNs) who are

Registered Nurses (RNs). VNs initiate home healthcare within 24 h of hospital discharge, perform comprehensive assessments, identify changes in physical and mental conditions, identify external barriers to maximum health, initiate preventive care, and treat problems or intervene to address other needs. Specialized home healthcare by VNs includes infusion therapy, wound care, pain management, providing home safety instruction and patient/family education. Specific examples of care include: giving IV drugs, shots, or tube feedings, changing dressings, and teaching about prescription drugs or diabetes care. VNs functioning in case management (case managers) create individual care plans that specify assessment, planning and methods for implementing services, interventions, and outcome evaluations. VNs work closely with patients, family members and other caregivers to ensure elderly individuals receive personalized and coordinated care in the home and across the community.[23]

3.6. Rehabilitation therapists

As a critical part of the healthcare team, rehabilitation therapists (including physical, occupational, and speech therapists) provide home-based therapies to help the elderly regain productivity and independence, allowing them to remain at home. Physical therapy helps individuals regain physical motion and strength. Their services address a variety of functional impairments, including: a loss of balance, a fall, difficulty walking, joint or back pain, hip or knee replacement surgery, a stroke, a heart attack or heart failure, or any noticeable decline in function. Occupational therapy helps the elderly regain daily skills such as dressing and feeding. These services are typically needed after any of the following events: hip or knee replacement surgery, a stroke, heart failure or a heart attack, joint pain in hands, arms or shoulders, difficulty dressing/bathing or with meals, declining memory or any noticeable decline in function. Speech and language therapists work with the elderly to improve breathing, speaking, swallowing, or using words to express themselves. The services may be provided due to the following situations: stroke, a heart attack, or difficulty with swallowing/speaking.[24]

3.7. Healthcare social workers

Healthcare social workers typically work on an interdisciplinary team with professionals of other disciplines as described above. Their services focus on helping patients understand their diagnosis and adjust to the change or challenge of lifestyle, housing, or healthcare. Social workers also help other healthcare professionals understand their patients' mental and emotional changes as a result of disease or illness. Geriatric social work is a sub-discipline of healthcare social work that specializes in helping the elderly and their families through social work or hospice and palliative care. They may visit the elderly at their home to help them develop plans for their well-being, solve and cope with problems in their everyday lives, respond to crisis situations such as elder abuse, refer them to community resources such as programs that provide the elderly with meals or home healthcare, and evaluate services provided to ensure that they are effective. In some cases, if the elderly become too disabled to remain at home, social workers provide information about assisted living facilities or nursing homes and work with the elderly in those settings.[25]

With the aging of the baby boomer generation, the need for professional caregivers to provide services at home has been dramatically increasing. For example, in 2008 there were approximately 156,000 registered nurses working in home health settings. The number increased to 164,000 in 2012.[26,27] The number of occupational therapists who worked in home health settings was 6000 in 2010 and rose to 164,000 in 2012.[28,29] The need for such services is expected to continue to increase rapidly. However, the demand for professional services is also related to the ability of patients to pay, either directly or through health insurance. In the U.S., Medicare is the federal health insurance program for people age 65 or older. Medicare covers home healthcare expenses only if the elderly individual is diagnosed by a doctor as being homebound. For example, they must attest that the elderly person needs the help of another person or medical equipment such as crutches, a walker or a wheelchair to leave home, or that, even with help, they cannot leave home.[30] Insurance limits coverage for visits/services based on an assessment of the patient's health condition and care needs.

4. How does technology support caregiving in homes?

While caregivers play the most significant role in keeping the elderly at home, home care technology now provides essential tools to permit this caregiving at a cost-effective scale. Many technologies have been developed to improve patient outcomes and lower the overall cost of care delivery while the patients remain at home.

4.1. Remote monitoring/telehealth

Remote monitoring or telehealth is an all-inclusive term that describes the use of high-tech technologies to support long-distance care for patients. The monitoring can occur continuously in real-time or periodically. Home health remote monitoring or telehealth is a service that gives the professional caregiver, especially home healthcare nurses, the ability to monitor and measure the patient's health conditions from a distance. Such systems can record and monitor a wide range of items such as an electrocardiogram (ECG), pulse oximetry, vital signs, weight, and blood glucose. Data are being collected from patients with a variety of chronic diseases, such as congestive heart failure, hypertension, diabetes, and asthma. Technology often also allows healthcare providers to communicate with their patients remotely, make changes to their planned behavior or diet on a real-time basis, and monitor the patients' physical reactions to those changes. A meta-analysis of the use of several such systems found that home health remote monitoring overall has had a moderate, positive and significant effect on healthcare outcomes for patients with heart disease and psychiatric conditions, but not for diabetic patients.[31] However, studies have shown the impact of remote monitoring on reducing repeated hospitalizations for home healthcare elderly with chronic heart failure and the number of nursing visits per week for those with diabetes.[32,33] With all of the challenges faced by the U.S. healthcare system, increasing healthcare needed by the aging population, a severe healthcare provider shortage, tightening healthcare budgets and insurance limits, and increased use of remote monitoring systems will likely play a growing role in providing access and continuity of care for the elderly to enable them to remain at home, as most have indicated they would prefer.

4.2. Other essential technologies

On the professional side, home healthcare agencies have also adopted many technologies to better manage their operations and improve patient care. For example, to manage the logistics of visiting services and improve scheduling, a computerized system called Scheduling has been used to determine the most efficient and effective visiting schedule based on an analysis of important factors such as the patient's location, personal preferences, physician orders, and nurse availability. Another system, by connecting scheduling and telephony, transfers data through the patient's

telephone to report the exact start and stop time for each visit. Using the telephone, healthcare providers such as visiting nurses can also collect basic vital signs, care performed and other essential information. This automated (or semi-automated) home care documentation process has been effective in significantly reducing paperwork, and it also provides electronic visit verification. Other software systems for billing purposes are also essential given the vast array of payer sources in the U.S.[34]

5. Conclusions

Population aging and the growing prevalence of chronic health conditions among the elderly are straining healthcare budgets and families. In the U.S., there is a growing need for and interest in providing more complex healthcare in people's own homes, supported by a variety of caregivers. However, no one type of care is favored by, or available to, all. In this model, not all caregivers may have the resources to provide the complete range of care that is needed or be able to detect critical changes in health status quickly. In this context, extra effort is thus needed to coordinate among caregivers and outside services to effectively track changes in health conditions over time. To bridge the gaps and help guide and monitor care in such situations, an increased use of technology has been brought to support home caregiving, including software systems, networked health-monitoring devices, and telephony. This article discusses a variety of options for different types of professional and non-professional caregivers and services for the elderly in their homes used in the U.S. and how technology has been used to support this heterogeneous model of caregiving. These ideas offer a possible path for other societies, such as China and India, that are facing growing health needs and limited resources to care for their elderly population.

Conflicts of interest

All the contributing authors declare no conflicts of interest.

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